MEASUREMENT TECHNOLOGIES

AMBIENT AIR AND METEOROLOGICAL MONITORING
FOR
TRUE GEOTHERMAL ENERGY COMPANY
KILAUEA MIDDLE EAST RIFT ZONE, ISLAND OF HAWAII

JANUARY 1990 DATA REPORT

CN-137

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1.0 Introduction

Measurement Technologies has been contracted by True Geothermal Energy Company to conduct an air quality and meteorological monitoring program to support incremental exploration and development of the Kilauea Middle East Rift Zone Geothermal Resources Subzone (GRS), Puna District, Island of Hawaii. The data gathered in the monitoring program is being used in support of the exploration and possible development of the geothermal resource.

The monitoring program consists of two (2) monitoring sites. The first site (Site 1) is located in the Kaohe Homesteads area and the second site (Site 2) is located at the geothermal drilling and staging area D-1. The monitored parameters for each site are contained in Table 1-1. The sites are being operated consistent with the guidelines and requirements as outlined in the following documents:

- "Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), U.S. EPA-450/4-80-012, November 1980.
- "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume IV. Meteorological Measurements, U.S. EPA-600/4-82-060, February 1983.
- "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Specific Methods, U.S. EPA-600/4-77-027a, May 1977.

As part of the monitoring program, Measurement will submit monthly and quarterly reports to True Geothermal Energy Company. The reports will contain the monitoring data, results of the quarterly quality assurance audits and results of quality control activities such as SO2 and H2S gas analyzer precision checks, level 1 and 2 checks and multipoint calibration results.

Section 2.0 of this report contains a operations narrative of significant events and activities that occurred during the month of January. Section 3.0 of this report contains the data collected during the month with graphical presentations and data capture summaries. The data is presented by site numbers and may also be referred to by name. Site 1 and 2 names are Air Quality/Met and Met Site, respectively.

Table 1-1. Monitored Parameters

PARAMETER	SITE 1	SITE 2 (MET)
HYDROGEN SULFIDE (H2S)	X	8 PLS
SULFUR DIOXIDE (SO2)	X	
WIND DIRECTION	X	X
WIND SPEED	X	X
VERTICAL WINDS		X
SIGMA THETA	X	X
SIGMA W		X
TEMPERATURE	X	
PRECIPITATION	X	
RAIN WATER (ANIONS & DISSOLVED METALS)	3 PLS	
METALS (ATMOSPHERIC PARTICULATE)	X	
TOTAL SUSPENDED PARTICULATES (TSP)	X	
INHALEABLE PARTICULATES (PM-10)	X	
RADON		X

2.0 Operations Summary

This section discusses the operations of the two monitoring sites and any significant events that may affect data quality. A downtime summary is also provided.

2.1 Monthly Operations Summary

Site 1 operations were routine for the month of January. The blank rain water samples are True 4-2 and True 4-3 shown in Tables 3-8 and 3-9 respectively. The metals filter analyses loadings and the particulate filter loadings for the month of January show in general insignificant concentrations/loadings of the monitoring program compounds of interest.

The wind speed sensor at Site 1 (Air Quality Met) failed on the 19th of January and was replaced on January 20, 1990. The problem was traced to a faulty reed switch in the sensor. The wind direction and sigma theta was down also during the same time period because the data acquisition system uses the wind speed data to calculate vector winds. There was a 28 hour loss of wind speed, wind direction and sigma theta data due to the faulty sensor.

Site 1 was audited on January 22, 1990 through January 24, 1990. All instrumentation and analyzers passed the air quality audit. Sulfur dioxide (SO2) analyzer span dropped significantly January 28, 1990 due to O-ring failure in the burner block. The burner block was rebuilt with unsatisfactory results. Analyzer sent to Measurement Technologies for repairs. The hydrogen sulfide (H2S) analyzer was set up to monitor total sulfur on January 30 until a repair/replacement analyzer could be sent in.

Site 2 lost 74 hours of data for all parameters for the month beginning the 16th of January at 10:00. The problem began when the data cartridge was changed out on the 16th. More than likely the data cartridge was not plugged in its receptacle all the way. Measurement is currently trying to unscramble the data that was on the cartridge. The meteorological audit was performed on the 23rd and the 24th of January. Each of the meteorological parameters passed the audit. No hydrogen sulfide (H2S) was detected on the dosimeters for the month.

2.2 Downtime Summary

This section presents the down time summary by site. Down time is considered any time an analyzer or sensor is not collecting valid data. Down time includes calibration time, data lost due to data validation criteria such as insufficient data samples, sensors or analyzers operating outside of allowable limits, etc. Calibration and audit time and time lost due to maintenance and malfunctions is also considered down time.

There was approximately 34 hours of H2S data downtime for the month of January at Site 1. The majority of downtime was caused by calibration time, hydrogen bottle change out, and audit time. The SO2 downtime during the month of operation at Site 1 was approximately 64 hours. Approximately 30 of the hours were a result of the defective burner block. The balance of down time was the result of generator maintenance, changing out the hydrogen gas cylinders, calibration time and audit time. Approximately 28 hours of wind speed, wind direction and sigma theta data was lost at Site 1 because of a faulty wind speed sensor.

There was a loss of approximately 74 hour of wind speed, wind direction, sigma theta, vertical wind speed, and

sigma W at Site 2 due to a problem with the data acquisition system data cartridge.

2.2 Major Activities

The air quality/meteorological audit was performed at Sites 1 and 2 in late January. No problems were encountered and all site monitoring parameters passed within EPA acceptable limits.

3.0 Data Summary

Section 3.0 contains monthly summary reports and statistic tables for all of the major monitored parameters. In addition, graphical wind rose plots, rain water analyses results, total suspended (TSP) and inhaleable (PM-10) particulate loading and metals analyses are also contained in this section. The data and associated graphical presentations are presented by site. Each sites data is organized and presented as follows:

- Monthly Summary Report containing the hourly values for each day of the month. Dashes contained in the place of any data signifies that the data falls into a down time category previously discussed in Section 2.0. An asterisk sign in the wind sigma theta signifies calm wind conditions.

- A graphical wind rose presentation will immediately follow the Monthly Summary Report. The wind rose displays a graphical presentation of the wind speed and direction at each site.

- Summary Statistic Tables containing the highest and second highest measured values, lowest value, arithmetic mean and standard deviation, data recovery rates and percentile breakdowns of measured values.

- TSP and PM-10 particulate data showing loading of each filter along with the elemental analyses of each metals filter (Site 1 only).

- Rain water analyses results showing each sample collected and the results of the metals elemental and anion analyses (Site 1 only).

3.1 Air Quality/Meteorological Monitoring Data Site 1

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 1 WD (DEG) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	328	56	337	317	311	300	332	326	321	330	326	333	67	101	350	59	326	324	317	316	304	282	294	306
2	301	290	310	323	323	327	333	340	342	348	350	2	2	21	353	349	343	342	332	113	337	318	301	326
3	338	344	320	311	321	314	324	329	351	355	3	16	351	12	8	5	348	347	329	320	319	302	308	323
4	323	324	317	351	339	20	316	324	339	64	346	333	339	336	349	----	345	341	333	328	319	311	313	308
5	306	310	306	310	309	301	243	311	311	316	328	351	358	48	0	1	3	328	312	322	318	314	304	309
6	299	308	301	258	294	272	251	272	----	346	112	70	352	40	27	2	349	345	326	308	283	287	242	184
7	240	201	229	220	247	285	263	217	184	134	126	125	118	122	119	119	126	130	----	225	226	0	219	220
8	218	221	218	233	252	237	212	270	334	347	349	359	359	47	28	353	350	347	338	338	335	324	316	321
9	324	339	339	349	351	353	351	353	351	353	348	348	351	352	351	351	346	344	346	339	338	337	336	338
10	332	330	324	318	322	329	329	327	320	329	342	348	345	349	352	348	350	348	345	336	336	337	333	330
11	332	334	330	332	325	327	327	320	329	340	341	349	342	349	349	350	351	344	349	339	336	333	339	337
12	336	338	340	336	334	335	325	----	343	349	350	352	348	347	39	11	12	342	352	313	332	139	313	254
13	271	124	129	123	245	189	223	200	284	336	62	126	151	130	124	122	127	142	0	164	206	205	155	142
14	121	127	123	115	132	136	114	118	----	121	116	122	120	124	132	123	213	266	238	202	198	202	207	208
15	215	233	206	168	213	287	301	299	315	319	308	323	343	129	124	352	337	320	309	315	311	299	192	214
16	229	259	188	200	293	270	282	246	----	346	140	128	148	12	167	302	244	171	127	323	312	310	206	203
17	249	244	262	297	313	309	306	314	326	335	340	345	349	347	345	345	343	339	336	336	330	330	332	332
18	331	331	331	333	332	328	326	324	----	330	338	331	320	133	144	145	127	118	122	119	123	122	123	126
19	121	122	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	177	326	333	321	341	73	137	----	292	171	334	326	316	179	333	295
21	313	186	166	196	168	160	217	219	175	148	152	142	168	156	129	121	114	128	122	121	123	120	120	125
22	127	118	122	170	132	128	123	125	----	----	123	137	122	124	121	----	130	111	139	119	131	68	128	115
23	126	123	132	144	249	294	255	127	117	127	123	128	141	136	123	141	130	125	125	125	131	127	151	111
24	175	209	188	136	188	203	204	139	133	173	124	120	----	----	123	120	119	127	130	118	125	123	124	125
25	127	130	203	128	121	121	123	124	127	120	116	126	122	126	123	121	123	137	203	143	142	117	64	67
26	117	104	152	122	137	135	139	129	113	103	115	123	120	123	115	126	96	73	318	203	315	317	299	316
27	326	307	321	304	322	303	315	202	9	334	342	44	97	22	93	356	354	351	354	347	353	351	337	338
28	331	335	319	319	313	300	325	313	311	325	342	349	344	349	344	352	349	351	351	347	348	347	343	340
29	349	343	345	333	336	329	325	344	347	----	350	358	353	353	351	352	350	349	346	340	344	334	333	330
30	332	337	340	348	347	341	343	343	341	346	354	7	354	3	4	1	2	354	352	348	347	350	350	350
31	346	340	345	338	344	327	335	328	327	331	333	346	1	11	6	4	2	338	330	355	356	70	5	92

Table 3-1. Wind Direction Monthly Summary Site 1

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 1 WS (MPH) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	4.5	0.6	3.5	3.9	3.1	1.9	1.7	5.5	5.7	6.4	6.7	6.5	1.0	1.2	2.9	1.0	4.2	3.1	4.2	2.7	2.2	1.2	1.3	2.8
2	2.4	1.6	2.3	3.0	4.2	4.7	5.0	4.9	5.4	5.1	3.4	2.7	3.5	1.9	3.9	3.5	3.1	2.7	1.3	0.5	2.0	1.2	2.1	1.2
3	2.1	1.2	3.1	2.8	4.1	4.4	4.0	3.0	1.9	1.9	2.5	2.3	2.8	2.1	2.0	1.6	3.1	1.5	2.6	2.8	2.4	1.9	2.8	2.5
4	2.7	2.0	0.9	1.6	1.1	0.2	1.8	3.8	3.3	1.7	2.9	6.5	5.5	5.5	4.7	----	5.1	4.9	5.3	5.0	5.1	3.9	3.9	3.8
5	2.8	2.3	3.6	3.3	3.2	2.6	0.8	2.5	2.9	3.2	3.4	2.6	2.7	1.2	2.2	1.9	1.6	1.0	0.8	0.2	2.1	2.5	2.4	3.7
6	2.4	1.4	1.8	0.8	1.9	1.2	0.6	0.7	----	1.3	1.7	1.0	2.9	1.1	1.7	2.5	2.6	2.8	2.0	1.5	0.9	0.7	0.4	1.1
7	0.4	0.4	0.6	0.4	0.9	0.8	0.6	0.7	1.0	1.7	2.4	2.7	3.4	2.9	3.0	2.2	1.6	0.2	----	0.8	0.4	0.0	0.6	0.9
8	0.7	0.5	0.7	0.3	0.7	0.6	0.7	1.3	3.2	3.4	3.5	2.3	2.1	0.9	1.4	3.7	4.2	4.2	4.2	4.6	4.9	4.7	4.1	4.1
9	4.9	5.6	6.4	6.7	6.8	6.7	5.6	3.6	5.5	5.0	5.7	5.8	5.7	6.8	6.2	5.8	7.2	6.5	7.6	8.1	8.1	7.8	7.6	6.8
10	5.8	5.6	5.9	4.9	5.0	5.4	4.9	5.9	5.2	5.8	6.3	5.7	6.6	5.9	5.9	6.1	5.2	6.0	5.8	7.0	7.1	7.9	7.1	7.8
11	7.5	7.4	6.8	6.1	5.7	4.1	5.4	6.2	6.4	8.1	7.2	4.0	7.1	6.5	5.8	6.3	6.3	5.6	4.8	6.1	7.3	6.5	6.9	6.8
12	6.4	5.6	4.9	4.6	5.3	5.2	4.9	----	4.8	3.7	4.3	3.8	4.6	3.2	1.5	1.0	1.7	1.5	0.4	0.4	1.1	1.4	0.7	0.5
13	0.5	0.5	0.5	0.2	0.2	1.0	0.3	0.2	1.0	1.2	0.9	2.1	1.6	2.4	3.2	2.4	2.3	1.0	0.0	0.3	0.4	0.3	0.5	0.3
14	0.8	0.3	1.1	0.9	1.0	1.0	1.1	2.3	----	2.2	2.9	1.7	1.7	2.4	0.7	0.9	0.0	0.1	0.6	0.7	0.7	0.9	1.1	1.1
15	1.2	0.1	0.3	0.6	0.2	0.4	2.3	1.6	3.8	2.9	2.9	2.8	1.8	0.7	0.9	1.3	2.3	2.1	2.0	1.4	2.0	2.2	0.9	1.2
16	0.0	0.7	0.9	0.2	0.3	0.6	1.0	0.5	----	0.1	1.5	0.9	0.6	0.6	0.8	1.2	0.7	0.9	2.1	0.6	1.7	1.2	0.4	0.3
17	0.3	0.2	0.4	1.8	3.7	2.7	3.6	3.7	5.6	7.7	6.8	7.3	7.8	8.3	8.3	7.2	6.8	8.0	7.4	6.7	8.0	8.9	9.7	9.5
18	10.5	10.0	9.9	10.6	9.6	9.4	7.0	5.0	----	5.0	4.8	3.5	0.3	2.5	0.6	0.8	3.3	4.1	4.6	3.5	4.5	4.5	5.3	4.6
19	4.9	4.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	1.0	1.1	2.9	3.6	2.2	0.3	1.8	----	0.3	2.0	0.3	2.0	1.4	0.7	2.0	0.7
21	0.1	0.6	0.2	0.2	0.5	0.1	0.2	0.7	0.6	1.6	1.2	2.2	2.5	1.5	2.0	3.6	1.6	1.9	1.8	2.1	1.9	2.7	3.1	3.0
22	2.0	1.6	2.6	0.8	0.4	1.4	2.2	3.3	----	----	3.0	2.1	2.9	3.6	2.9	----	1.6	0.8	0.2	1.5	1.4	0.4	1.0	1.3
23	2.1	0.8	0.9	0.1	0.6	0.5	0.2	0.9	1.9	2.7	3.4	2.3	1.8	2.5	2.8	2.3	2.1	2.5	2.8	2.9	2.7	0.5	0.6	0.7
24	0.6	0.7	0.4	0.5	0.5	1.2	0.9	2.4	2.6	1.8	1.3	3.9	----	----	3.6	2.9	2.1	2.2	1.1	1.8	1.9	2.8	2.3	3.1
25	1.4	1.3	0.5	1.9	2.6	2.4	1.9	2.3	3.5	2.7	2.7	2.9	3.4	3.2	2.9	2.7	2.7	0.6	0.5	0.2	0.2	0.3	0.1	0.2
26	0.8	0.7	1.2	1.7	1.4	2.2	1.5	0.9	1.5	1.4	2.1	2.8	2.1	2.6	2.0	2.2	0.8	0.4	0.9	0.2	1.2	1.8	1.6	2.6
27	1.2	2.4	1.4	2.2	2.0	2.3	1.0	0.1	1.5	2.3	1.3	1.0	1.3	1.6	2.0	2.8	3.0	3.2	1.7	2.8	2.6	1.0	1.9	2.7
28	3.1	3.4	3.8	3.1	3.4	1.8	2.4	3.8	3.6	4.4	5.5	4.8	5.8	5.3	5.9	4.8	6.5	5.7	5.5	5.2	5.9	5.6	5.7	5.6
29	4.5	4.9	4.0	2.8	4.2	4.0	4.2	3.0	2.1	----	3.6	3.8	5.8	4.2	5.6	5.0	5.9	5.7	5.0	5.5	5.4	6.5	6.5	6.7
30	5.9	5.6	6.0	4.8	4.8	5.0	5.6	4.5	5.2	5.1	3.6	2.9	2.9	3.6	2.3	2.9	3.1	4.1	3.9	3.6	4.5	5.2	5.4	4.9
31	6.3	6.5	4.8	5.3	4.9	4.8	5.8	5.2	4.2	5.3	5.3	3.7	2.1	1.5	2.2	2.1	1.8	4.1	2.8	2.8	2.7	0.4	1.4	0.6

Table 3-2. Wind Speed Monthly Summary Site 1

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 1 SigÕ1 (deg) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	42.8	73.9	20.9	21.5	23.5	38.2	48.1	19.6	19.3	17.1	17.9	30.1	77.2	82.8	50.9	75.1	20.5	31.9	19.3	37.9	56.9	62.4	54.0	33.5
2	45.1	35.5	50.3	25.4	18.3	16.0	17.5	19.7	21.5	37.7	58.0	71.3	59.7	75.2	56.6	45.5	49.6	41.8	71.0	72.1	50.3	30.9	27.9	53.9
3	48.8	56.6	22.1	49.2	18.5	17.4	20.3	22.1	48.8	60.3	65.3	72.0	64.0	72.0	73.0	74.3	45.4	49.3	24.1	18.3	20.2	39.1	18.5	30.0
4	18.7	38.2	42.9	53.9	65.2	79.0	64.1	16.4	30.1	79.0	49.6	19.6	29.0	29.6	31.9	----	34.7	23.1	16.8	16.9	15.5	19.3	21.5	19.7
5	28.4	34.8	21.8	25.7	37.2	28.1	49.6	48.2	35.1	52.6	33.1	59.2	63.1	84.4	70.8	70.1	67.4	45.1	26.2	64.1	20.9	16.5	21.0	19.6
6	25.4	54.7	37.1	47.3	33.6	34.4	32.8	29.5	----	62.6	67.5	83.1	59.7	79.4	67.0	59.9	52.1	31.9	19.2	21.8	39.0	40.0	28.9	33.7
7	30.8	52.7	39.5	45.0	63.0	57.6	68.4	37.5	38.2	56.6	52.2	54.5	50.0	55.9	46.6	57.0	61.4	87.6	----	13.2	96.1	97.6	68.5	23.2
8	28.0	35.7	26.3	52.0	27.8	41.8	35.6	26.8	20.7	35.9	42.7	62.7	65.8	77.3	78.7	50.9	38.1	23.8	19.0	19.7	18.4	15.1	15.6	16.2
9	17.9	20.5	20.8	29.5	28.5	32.8	42.4	59.3	35.8	52.2	41.2	39.8	37.7	29.4	31.2	33.8	25.1	23.3	23.3	20.8	19.2	19.9	18.9	20.3
10	17.9	16.9	16.2	15.9	16.7	17.5	16.8	16.8	16.9	17.9	21.9	24.0	26.8	39.3	34.2	27.2	28.7	22.5	21.3	17.7	18.6	19.4	16.3	16.8
11	18.3	19.1	16.9	19.1	18.8	28.2	17.5	18.6	18.6	20.1	23.5	56.7	25.5	33.2	40.9	34.7	32.0	26.0	32.2	20.1	17.9	18.8	21.2	19.7
12	20.2	23.2	21.2	24.0	18.6	26.7	21.2	----	27.1	43.8	45.5	46.2	43.4	55.8	81.3	78.3	65.1	54.4	71.5	70.9	67.0	53.3	61.5	61.0
13	57.3	86.5	91.5	****	60.2	47.0	67.1	80.7	62.7	61.3	58.9	55.3	61.0	59.9	52.5	45.9	40.1	51.2	97.6	47.2	52.7	45.4	53.6	56.6
14	85.2	****	75.7	80.2	69.6	89.8	69.2	60.5	----	65.9	64.9	80.7	70.2	66.9	87.9	84.4	92.8	87.4	75.4	67.9	78.1	79.4	76.4	78.3
15	71.0	88.0	67.3	57.7	85.1	60.6	39.4	43.5	44.3	33.0	37.3	40.7	49.8	80.6	60.5	44.6	18.7	22.9	20.3	37.7	41.3	39.7	34.7	23.8
16	****	49.0	39.6	37.7	74.2	41.2	46.0	45.6	----	38.9	53.3	67.6	60.2	58.7	54.2	68.2	71.7	46.7	42.8	63.0	56.5	47.9	52.3	54.8
17	72.1	36.1	44.5	25.1	20.9	24.2	19.4	20.4	16.3	16.8	20.4	24.1	24.3	23.7	24.3	27.5	24.6	21.0	19.1	17.9	17.6	16.3	16.6	17.1
18	17.0	17.1	17.1	17.4	17.2	16.4	16.8	18.3	----	18.3	19.2	25.6	76.1	53.1	93.3	87.4	56.4	48.8	44.1	49.5	43.4	41.1	45.2	47.0
19	49.5	41.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	97.6	58.2	43.3	22.4	39.0	77.8	55.3	----	65.4	33.6	65.8	30.7	33.7	33.3	45.1	35.0
21	61.1	37.1	62.7	53.7	46.3	85.2	39.1	57.5	71.3	70.1	70.7	71.4	70.8	82.5	77.8	58.9	78.1	78.3	73.2	65.2	73.1	56.1	48.8	48.7
22	61.5	62.6	53.1	79.6	93.3	73.0	58.3	47.4	----	----	59.7	55.5	50.6	42.7	42.9	----	55.9	72.6	49.6	55.1	63.1	72.5	57.7	67.6
23	41.5	65.4	49.4	88.8	77.3	69.8	58.6	68.5	58.2	49.0	48.3	67.4	71.0	56.0	50.0	64.0	60.9	45.7	57.5	47.8	51.4	85.2	84.9	85.5
24	90.1	77.3	80.1	83.5	89.6	74.7	86.5	69.0	67.3	71.9	77.5	48.4	----	----	49.4	53.4	54.4	55.1	79.0	54.8	62.7	41.3	41.8	38.6
25	67.4	56.7	56.2	58.9	50.7	48.7	47.7	42.3	39.3	46.5	51.2	43.9	47.7	41.3	42.6	42.1	42.4	63.1	77.5	62.4	****	76.3	81.2	77.2
26	80.3	72.1	51.7	62.4	70.7	40.7	38.3	43.4	63.1	72.6	61.8	55.9	60.2	54.9	62.4	53.6	79.6	80.9	60.5	60.0	30.2	22.6	21.8	21.9
27	57.1	44.8	77.0	32.2	50.4	25.7	48.8	63.0	55.9	45.5	61.4	72.1	75.0	75.7	72.5	59.1	60.2	45.0	68.1	39.9	44.6	50.0	38.4	24.8
28	16.8	18.0	16.9	20.4	24.0	29.7	25.6	25.3	23.5	19.2	21.5	28.7	22.9	31.5	26.8	42.8	33.1	28.1	29.5	29.5	24.2	22.7	28.6	20.2
29	38.6	26.8	43.0	39.0	23.1	48.7	22.6	43.0	45.7	----	50.9	54.7	38.1	55.6	41.9	41.3	34.8	28.4	23.5	19.0	23.2	21.2	19.4	16.7
30	17.3	20.5	20.8	32.7	28.3	23.0	22.2	26.0	20.6	27.9	54.2	67.1	69.3	54.1	69.1	67.1	62.6	51.3	50.5	47.0	38.2	29.9	31.1	34.7
31	27.6	30.9	32.2	20.4	20.9	16.0	20.2	17.6	19.6	25.7	24.6	46.8	70.3	79.7	69.6	70.8	66.0	23.8	47.8	50.9	48.7	80.9	63.1	84.0

Table 3-3. Sigma Theta Monthly Summary Site 1

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 1 TEMP (DEG F) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	64.3	65.4	65.3	65.1	64.3	63.2	63.2	63.2	63.8	66.5	67.3	65.0	66.2	66.9	66.6	64.9	65.4	64.6	63.9	63.8	64.0	64.0	63.9	64.7
2	64.7	64.3	64.4	64.8	64.7	65.0	65.5	66.0	67.6	69.7	71.2	72.1	71.7	72.4	71.3	68.9	66.0	65.8	65.7	65.9	66.1	65.9	65.5	65.6
3	65.7	64.9	64.4	64.1	64.1	64.3	64.6	65.6	68.6	68.3	71.2	71.8	71.2	73.4	71.9	70.1	70.4	66.7	66.1	66.0	66.1	65.8	65.7	65.7
4	65.8	65.4	65.5	65.8	65.3	64.9	64.7	66.9	68.0	69.4	69.1	67.9	68.0	67.2	66.7	----	66.8	66.6	65.5	64.9	64.2	64.0	64.1	64.2
5	64.0	63.2	62.8	63.2	63.1	62.6	63.4	63.9	65.4	67.1	69.4	71.1	72.0	73.8	73.0	74.0	71.4	67.3	65.5	65.1	64.8	64.7	64.0	64.6
6	64.4	63.7	63.0	62.2	63.4	62.9	62.2	68.5	----	73.9	74.4	74.8	74.3	72.8	73.0	74.1	70.7	67.8	65.8	65.1	64.4	64.0	63.0	63.2
7	63.3	61.7	61.7	62.6	62.9	62.7	62.9	64.2	67.4	72.7	73.2	74.8	74.8	75.2	74.9	76.6	75.5	67.2	----	64.1	63.1	62.3	62.8	63.3
8	63.1	62.7	62.9	63.7	64.0	63.4	62.3	69.4	74.2	72.5	72.4	73.0	75.8	77.6	77.7	72.4	71.0	69.0	68.0	68.0	67.0	66.0	66.0	66.0
9	66.0	66.0	66.0	67.0	67.0	67.0	66.0	66.0	66.0	67.0	66.0	66.0	66.0	66.0	65.0	65.0	64.0	64.0	63.0	63.0	63.0	63.0	63.0	62.0
10	62.0	61.0	61.0	61.0	61.0	61.0	61.0	62.0	63.0	66.0	68.0	68.0	69.0	70.0	68.0	68.0	67.0	66.0	64.0	63.0	64.0	62.0	62.0	61.0
11	62.0	61.0	61.0	61.0	60.0	60.0	60.0	62.0	64.0	66.0	64.0	65.0	67.0	68.0	69.0	69.0	66.0	64.0	63.0	62.0	62.0	62.0	62.0	62.0
12	62.2	62.2	62.1	61.9	61.4	61.5	61.3	----	64.3	64.5	66.4	68.0	67.6	69.1	69.8	71.2	70.3	65.9	64.4	63.3	63.1	62.2	61.9	62.1
13	62.4	62.5	62.6	62.6	62.2	61.1	61.3	63.1	70.5	68.8	70.3	70.9	68.4	69.8	69.5	67.6	67.0	65.4	64.0	63.8	64.2	64.3	64.0	63.9
14	64.1	64.5	64.9	64.9	64.6	65.1	65.4	67.7	----	69.8	71.6	72.4	70.5	72.6	72.9	71.7	70.2	67.8	66.5	66.5	66.2	66.6	66.5	66.5
15	66.6	66.6	66.3	65.8	64.8	63.7	62.9	62.7	63.5	63.2	62.9	64.2	65.1	65.1	65.8	66.3	65.4	64.4	63.7	63.0	62.4	62.4	62.3	62.4
16	61.5	61.7	61.5	60.7	61.1	61.8	62.3	64.6	----	70.0	70.3	70.6	70.5	71.3	67.0	66.5	65.8	64.1	65.6	65.8	65.6	64.9	64.5	64.0
17	63.4	63.0	62.5	62.4	62.1	62.2	62.4	63.1	64.9	67.0	68.5	69.0	70.0	69.5	69.1	67.5	65.8	65.8	65.0	65.6	65.5	65.1	65.3	65.2
18	65.1	64.8	64.7	64.9	65.1	64.9	64.9	65.6	----	66.7	67.6	68.8	71.5	71.6	71.3	71.2	70.0	70.0	70.1	70.0	69.9	69.9	69.9	67.9
19	69.1	68.9	69.3	69.3	69.3	69.1	69.1	69.3	69.4	----	68.9	69.2	69.4	69.4	69.8	70.1	70.0	70.4	70.3	70.7	70.3	----	70.1	67.4
20	67.7	68.0	68.4	68.1	66.9	66.2	66.0	----	67.5	67.9	68.2	69.2	70.5	69.5	68.6	----	67.7	66.1	65.5	65.8	65.9	65.8	65.9	66.0
21	65.9	65.7	65.2	65.8	65.2	64.3	64.9	67.9	71.8	73.1	70.4	68.8	70.9	70.0	69.6	69.9	70.0	69.6	69.6	69.4	69.5	69.6	69.7	69.4
22	69.2	68.8	68.4	67.6	68.0	67.9	68.1	67.8	----	68.6	68.7	65.8	69.6	69.0	69.2	----	68.3	67.4	66.8	66.5	66.0	65.7	65.8	66.1
23	65.7	65.9	65.3	64.8	64.9	65.4	65.8	67.0	68.2	69.3	69.4	68.9	68.4	67.8	66.8	67.2	66.8	66.6	66.7	67.0	67.3	66.7	66.5	66.7
24	66.3	64.8	65.6	65.7	66.0	66.0	66.8	67.4	68.6	69.5	69.8	69.4	----	----	69.8	69.1	68.9	67.3	67.1	67.2	67.2	67.4	67.3	67.3
25	66.8	66.8	65.7	66.7	67.1	67.0	66.9	67.4	70.7	70.1	70.7	69.4	69.3	70.3	70.3	69.7	68.1	67.1	66.8	66.7	66.3	66.3	66.3	66.2
26	65.9	66.3	65.6	65.7	65.8	65.6	65.9	68.6	70.0	70.5	71.8	69.7	72.1	72.1	72.7	70.7	70.3	67.9	66.2	65.6	66.0	66.1	66.0	66.2
27	66.6	65.9	65.9	65.4	65.6	65.2	65.4	65.8	67.4	68.6	68.3	69.4	71.7	70.1	71.1	68.5	67.7	66.3	66.0	66.4	66.2	66.4	66.2	65.8
28	65.7	65.7	65.3	65.6	64.5	63.1	63.5	63.3	64.8	67.5	68.2	67.8	68.1	69.1	69.1	70.5	70.9	68.5	67.1	65.8	66.3	66.2	66.1	65.8
29	66.1	66.1	65.8	64.9	64.6	64.1	64.5	64.9	66.7	----	71.0	73.0	72.0	70.2	70.9	69.4	71.7	67.2	65.3	64.8	64.0	63.2	62.5	62.6
30	62.8	63.4	63.8	63.6	63.5	63.6	64.1	63.9	64.4	65.3	67.3	69.1	69.8	68.2	70.4	70.2	69.0	67.8	66.8	66.2	66.0	65.9	65.7	65.0
31	64.0	64.5	64.0	63.9	64.2	63.6	63.2	62.9	62.9	64.2	66.3	65.8	67.9	69.3	69.2	70.3	69.7	65.8	65.3	64.8	65.5	65.7	65.4	66.0

Table 3-4. Ambient Temperature Monthly Summary Site 1

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 1 RAIN (INCH) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1.29	0.01	0.00	0.19	0.03	0.00	0.00	0.02	0.07	0.00	0.23	0.82	0.22	0.09	0.09	0.18	0.02	0.37	0.05	0.03	0.08	0.03	0.00	0.00
2	0.09	0.00	0.25	0.15	0.04	0.00	0.08	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.12	0.03	0.18	0.07	0.00	0.21	0.04	0.00	0.05	0.06
3	0.01	0.00	0.01	0.04	0.00	0.02	0.03	0.00	0.06	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.04
4	0.00	0.01	0.07	0.00	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.12	0.07	0.14	----	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.03	0.01	0.00	0.00	0.01	2.06	0.03	0.11	0.05	0.11	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
7	0.00	0.00	0.00	0.01	0.03	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	----	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
9	0.00	0.02	0.01	0.00	0.08	0.01	0.03	0.07	0.00	0.00	0.08	0.07	0.07	0.10	0.06	0.03	0.03	0.02	0.01	0.01	0.04	0.03	0.01	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.02	0.01	0.02	0.05	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.09	0.07	0.02
12	0.05	0.04	0.00	0.01	0.00	0.00	0.01	----	0.00	0.03	0.10	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.08	0.01	0.03	0.06
13	0.01	0.00	0.04	0.00	0.00	0.03	0.00	0.05	0.00	0.04	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.13	0.01	0.06	0.03	0.05	0.00	0.06
14	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	----	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.09	0.00	0.01
15	0.01	0.10	0.19	0.04	0.00	0.00	0.00	0.00	0.01	0.12	0.29	0.40	0.38	0.06	0.05	0.00	0.03	0.07	0.09	0.05	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	----	0.00	0.00	0.00	0.00	0.00	0.77	0.06	0.18	0.05	0.02	0.06	0.09	0.00	0.01	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.02	0.01	0.02	0.01	0.01	0.00	0.01
18	0.04	0.01	0.02	0.01	0.06	0.03	0.02	0.06	----	0.02	0.00	0.00	0.00	0.05	0.00	0.00	0.12	0.00	0.00	0.01	0.07	0.02	0.07	0.35
19	0.20	0.01	0.00	0.00	0.01	0.13	0.21	0.00	0.19	----	0.70	0.36	1.26	1.78	1.54	1.21	1.95	1.00	0.28	0.51	0.67	----	0.70	0.50
20	0.19	0.41	0.54	0.25	0.32	0.23	0.23	----	0.01	0.14	0.03	0.00	0.01	0.07	0.14	0.14	0.16	0.05	0.02	0.01	0.00	0.01	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	1.34	0.28	0.85	0.44	0.04	0.14	0.09	0.08	0.02	0.01	0.00	0.01	0.00
22	0.00	0.02	0.07	0.03	0.02	0.03	0.02	0.21	----	0.07	0.08	0.06	0.02	0.00	0.00	0.02	0.00	0.04	0.03	0.10	0.04	0.09	0.08	0.07
23	0.06	0.04	0.01	0.01	0.03	0.01	0.04	0.00	0.01	0.06	0.00	0.14	0.02	0.04	0.04	0.06	0.07	0.14	0.06	0.01	0.01	0.09	0.07	0.05
24	0.05	0.01	0.05	0.02	0.01	0.00	0.14	0.06	0.00	0.03	0.11	0.01	----	----	0.00	0.00	0.00	0.04	0.01	0.05	0.00	0.01	0.03	0.01
25	0.00	0.05	0.32	0.18	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.07	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.03
26	0.10	0.04	0.18	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
27	0.00	0.01	0.01	0.01	0.01	0.00	0.17	0.01	0.04	0.00	0.25	0.07	0.00	0.02	0.00	0.03	0.04	0.12	0.00	0.01	0.04	0.01	0.00	0.00
28	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.02	0.01	0.05	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01
29	0.01	0.03	0.11	0.11	0.08	0.05	0.02	0.09	0.00	----	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.02	0.07	0.02
30	0.08	0.05	0.12	0.12	0.06	0.06	0.03	0.09	0.00	0.05	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.09
31	0.06	0.01	0.02	0.01	0.00	0.00	0.02	0.00	0.02	0.04	0.16	0.00	0.04	0.02	0.00	0.05	0.04	0.00	0.09	0.12	0.18	0.11	0.02	0.16

Table 3-5. Precipitation Monthly Summary Site 1

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 1 SO2 (PPB) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0
8	0	0	0	0	0	0	0	0	3	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	----	0	0
20	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	----	6	2	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	----	----	----	----	----	----	----	----	----	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	----	----	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	----	----	----	----	----	----	----	----	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	----	0	0	----	----	----	----	----	----
29	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
30	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
31	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Table 3-6. Sulfur Dioxide Monthly Summary Site 1

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 1 H2S (PPB) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	0	0	0	0	0	0	0	0	0	----	----	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	----	----	----	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	----	0	0
20	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	----	----	----	----	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	----	----	----	----	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	----	----	----	----	----	----	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	----	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3-7. Hydrogen Sulfide Monthly Summary Site 1

HECO ENVIRONMENTAL LABORATORY
ENVIRONMENTAL DEPARTMENT
Rainwater Analysis Report

Report Date: February 2, 1990

Site: True/Geothermal
Pahoa, Hawaii

Sample Date: January 15, 1990
(All 4 samples collected
from 12/30/89 - 01/15/90

Parameter	Concentration (ug/L) True 1-2	True 2-2	True 3-2	True 4-2
pH	5.25	5.40	5.30	5.80
Aluminum	<10.0	<10.0	<10.0	<10.0
Arsenic	<5.0	<5.0	<5.0	<5.0
Barium	<20.0	<20.0	<20.0	<20.0
Cadmium	<1.0	<1.0	<1.0	<1.0
Chromium	<4.0	4.1	<4.0	<4.0
Copper	<10.0	<10.0	<10.0	<10.0
Iron	<10.0	<10.0	<10.0	<10.0
Lead	<5.0	<5.0	<5.0	<5.0
Magnesium	415	425	460	<100
Manganese	<5.0	<5.0	<5.0	<5.0
Mercury	<0.50	<0.50	<0.50	<0.50
Selenium	<5.0	<5.0	<5.0	<5.0
Silver	<2.0	<2.0	<2.0	<2.0
Sodium	3,990	4,150	4,470	510
Zinc	<10.0	<10.0	<10.0	<10.0
Bromide	<50	<50	<50	<50
Chloride	13,030	4,980	7,260	520
Fluoride	22	25	6	10
Phosphate	<61	<61	<61	<61
Nitrite	<4	<4	<4	<4
Nitrate	<13	16	<13	<13
Sulfate	1,040	1,040	1,340	<206
Sulfite	<150	<150	<150	<150

Analyzed by: CK DK
C. Kishimoto/G. Kitsuwa

Approved by: _____
George Yasutome
Senior Chemist

Table 3-8. Rain Water Analyses Monthly Summary Site 1
12/30/1989 - 01/15/1990

HECO ENVIRONMENTAL LABORATORY
ENVIRONMENTAL DEPARTMENT
Rainwater Analysis Report

Report Date: February 23, 1990

Site: True/Geothermal
Pahoa, Hawaii

Sample Date: January 31, 1990
(All 4 samples collected
from 01/16/90 - 01/31/90

Parameter	Concentration (ug/L) True 1-3	True 2-3	True 3-3	True 4-3
pH	5.20	5.05	5.10	6.05
Aluminum	10.5	10.3	<10.0	<10.0
Arsenic	<5.0	<5.0	<5.0	<5.0
Barium	<20.0	<20.0	<20.0	<20.0
Cadmium	<1.0	<1.0	<1.0	<1.0
Chromium	<4.0	<4.0	<4.0	<4.0
Copper	<10.0	<10.0	<10.0	<10.0
Iron	<10.0	10.3	10.0	<10.0
Lead	<5.0	<5.0	<5.0	<5.0
Magnesium	300	302	293	<100
Manganese	<2.0	<2.0	<2.0	<2.0
Mercury	<0.50	<0.50	<0.50	<0.50
Selenium	<5.0	<5.0	<5.0	<5.0
Silver	<2.0	<2.0	<2.0	<2.0
Sodium	2,960	2,970	2,850	500
Zinc	<10.0	<10.0	<10.0	<10.0
Bromide	<50	<50	<50	<50
Chloride	4,150	4,360	4,530	16
Fluoride	29	14	13	<5
Phosphate	<61	<61	<61	<61
Nitrite	<4	<4	<4	<4
Nitrate	<13	<13	<13	41
Sulfate	970	946	911	<206
Sulfite	<150	<150	<150	<150

Analyzed by: CK GK
C. Kishimoto/G. Kitsuwa

Approved by: George Yasutome
Senior Chemist

Table 3-9. Rain Water Analyses Monthly Summary
01/16/90 - 01/31/90

295/01-001 PROTOCOL: 5 SA

SAMPLE ID: MZ175
PARTICLE SIZE: C
ANALYSIS ID: MZ175
01/05/90
EXPOSED AREA: 13.18 SQUARE CM
MASS OF DEPOSIT: 23.+- 10. MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	.0000+-	.0073	.000+-	.096	.0000+-	.4183
SI	.0000+-	.0047	.000+-	.062	.0000+-	.2693
P	.0000+-	.0014	.000+-	.018	.0000+-	.0802
S	.0000+-	.0076	.000+-	.100	.0000+-	.4355
CL	.2416+-	.0289	3.184+-	.381	13.8447+-	6.2431
K	.0171+-	.0028	.225+-	.037	.9799+-	.4553
CA	.0112+-	.0018	.148+-	.024	.6418+-	.2975
TI	.0006+-	.0007	.008+-	.009	.0344+-	.0428
V	.0003+-	.0005	.004+-	.007	.0172+-	.0296
CR	.0024+-	.0006	.032+-	.008	.1375+-	.0690
MN	.0014+-	.0007	.018+-	.009	.0802+-	.0532
FE	.0155+-	.0016	.204+-	.021	.8882+-	.3969
NI	.0016+-	.0005	.021+-	.007	.0917+-	.0491
CU	.0040+-	.0006	.053+-	.008	.2292+-	.1054
ZN	.0000+-	.0004	.000+-	.005	.0000+-	.0229
GA	.0000+-	.0004	.000+-	.005	.0000+-	.0229
AS	.0000+-	.0006	.000+-	.008	.0000+-	.0344
SE	.0000+-	.0006	.000+-	.008	.0000+-	.0344
BR	.0000+-	.0008	.000+-	.011	.0000+-	.0458
RB	.0005+-	.0010	.007+-	.013	.0287+-	.0586
SR	.0000+-	.0011	.000+-	.014	.0000+-	.0630
Y	.0000+-	.0013	.000+-	.017	.0000+-	.0745
ZR	.0000+-	.0032	.000+-	.042	.0000+-	.1834
MO	.0068+-	.0048	.090+-	.063	.3897+-	.3231
PD	.0000+-	.0043	.000+-	.057	.0000+-	.2464
AG	.0000+-	.0051	.000+-	.067	.0000+-	.2923
CD	.0000+-	.0068	.000+-	.090	.0000+-	.3897
IN	.0018+-	.0083	.024+-	.109	.1031+-	.4777
SN	.0043+-	.0097	.057+-	.128	.2464+-	.5651
SB	.0057+-	.0146	.075+-	.192	.3266+-	.8486
BA	.0210+-	.0315	.277+-	.415	1.2034+-	1.8794
LA	.0622+-	.0485	.820+-	.639	3.5643+-	3.1821
HG	.0019+-	.0013	.025+-	.017	.1089+-	.0883
PB	.0040+-	.0027	.053+-	.036	.2292+-	.1840

Table 3-10. Metals Filter Analyses January 5, 1990 Site 1

295/01-001 PROTOCOL: 5 SA

SAMPLE ID: MZ176
PARTICLE SIZE: C
ANALYSIS ID: MZ176
01/11/90
EXPOSED AREA: 13.18 SQUARE CM
MASS OF DEPOSIT: 16.+- 10. MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	.0059+-	.0043	.078+-	.057	.4860+-	.4666
SI	.0026+-	.0024	.034+-	.032	.2142+-	.2388
P	.0021+-	.0016	.028+-	.021	.1730+-	.1705
S	.0145+-	.0072	.191+-	.095	1.1944+-	.9534
CL	.1118+-	.0149	1.474+-	.196	9.2095+-	5.8854
K	.0000+-	.0023	.000+-	.030	.0000+-	.1895
CA	.0003+-	.0015	.004+-	.020	.0247+-	.1245
TI	.0000+-	.0007	.000+-	.009	.0000+-	.0577
V	.0000+-	.0005	.000+-	.007	.0000+-	.0412
CR	.0012+-	.0006	.016+-	.008	.0989+-	.0791
MN	.0000+-	.0007	.000+-	.009	.0000+-	.0577
FE	.0156+-	.0016	.206+-	.021	1.2850+-	.8139
NI	.0011+-	.0005	.014+-	.007	.0906+-	.0700
CU	.0055+-	.0007	.072+-	.009	.4531+-	.2890
ZN	.0007+-	.0004	.009+-	.005	.0577+-	.0488
GA	.0000+-	.0003	.000+-	.004	.0000+-	.0247
AS	.0000+-	.0006	.000+-	.008	.0000+-	.0494
SE	.0000+-	.0006	.000+-	.008	.0000+-	.0494
BR	.0008+-	.0007	.011+-	.009	.0659+-	.0709
RB	.0006+-	.0010	.008+-	.013	.0494+-	.0880
SR	.0000+-	.0011	.000+-	.014	.0000+-	.0906
Y	.0006+-	.0012	.008+-	.016	.0494+-	.1036
ZR	.0000+-	.0031	.000+-	.041	.0000+-	.2554
MO	.0021+-	.0045	.028+-	.059	.1730+-	.3861
PD	.0000+-	.0040	.000+-	.053	.0000+-	.3295
AG	.0000+-	.0052	.000+-	.069	.0000+-	.4284
CD	.0000+-	.0064	.000+-	.084	.0000+-	.5272
IN	.0064+-	.0079	.084+-	.104	.5272+-	.7294
SN	.0182+-	.0093	.240+-	.123	1.4992+-	1.2103
SB	.0008+-	.0137	.011+-	.181	.0659+-	1.1293
BA	.0000+-	.0315	.000+-	.415	.0000+-	2.5948
LA	.0000+-	.0469	.000+-	.618	.0000+-	3.8634
HG	.0000+-	.0013	.000+-	.017	.0000+-	.1071
PB	.0000+-	.0026	.000+-	.034	.0000+-	.2142

Table 3-11. Metals Filter Analyses January 11, 1990 Site 1

295/01-003 PROTOCOL: 5 SA

SAMPLE ID: MZ169
PARTICLE SIZE: F
ANALYSIS ID: MZ169
01/17/90
EXPOSED AREA: 12.80 SQUARE CM
MASS OF DEPOSIT: 13.+- 10. MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	.0000+- .0026	.000+- .033	.0000+- .2560
SI	.0001+- .0016	.001+- .020	.0098+- .1577
P	.0000+- .0012	.000+- .015	.0000+- .1182
S	.0086+- .0071	.110+- .091	.8468+- .9555
CL	.0394+- .0073	.504+- .093	3.8794+- 3.0695
K	.0028+- .0022	.036+- .028	.2757+- .3031
CA	.0011+- .0013	.014+- .017	.1083+- .1527
TI	.0024+- .0007	.031+- .009	.2363+- .1944
V	.0001+- .0005	.001+- .006	.0098+- .0498
CR	.0014+- .0005	.018+- .006	.1378+- .1169
MN	.0015+- .0006	.019+- .008	.1477+- .1281
FE	.0243+- .0019	.311+- .024	2.3926+- 1.8500
NI	.0007+- .0005	.009+- .006	.0689+- .0724
CU	.0015+- .0005	.019+- .006	.1477+- .1238
ZN	.0005+- .0004	.006+- .005	.0492+- .0546
GA	.0000+- .0003	.000+- .004	.0000+- .0295
AS	.0000+- .0003	.000+- .004	.0000+- .0295
SE	.0000+- .0004	.000+- .005	.0000+- .0394
BR	.0001+- .0004	.001+- .005	.0098+- .0401
RB	.0003+- .0006	.004+- .008	.0295+- .0633
SR	.0007+- .0007	.009+- .009	.0689+- .0870
Y	.0000+- .0008	.000+- .010	.0000+- .0788
ZR	.0000+- .0023	.000+- .029	.0000+- .2265
MO	.0064+- .0032	.082+- .041	.6302+- .5781
PD	.0014+- .0024	.018+- .031	.1378+- .2590
AG	.0037+- .0027	.047+- .035	.3643+- .3863
CD	.0055+- .0032	.070+- .041	.5415+- .5223
IN	.0000+- .0040	.000+- .051	.0000+- .3938
SN	.0018+- .0051	.023+- .065	.1772+- .5203
SB	.0000+- .0076	.000+- .097	.0000+- .7483
BA	.0078+- .0176	.100+- .225	.7680+- 1.8309
LA	.0000+- .0268	.000+- .343	.0000+- 2.6388
HG	.0000+- .0008	.000+- .010	.0000+- .0788
PB	.0000+- .0019	.000+- .024	.0000+- .1871

Table 3-12. Metals Filter Analyses January 17, 1990 Site 1

295/01-003 PROTOCOL: 5 SA

SAMPLE ID: MZ177
PARTICLE SIZE: F
ANALYSIS ID: MZ177
01/23/90
EXPOSED AREA: 12.80 SQUARE CM
MASS OF DEPOSIT: 14.+- 10. MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	.0010+- .0028	.013+- .036	.0914+- .2642
SI	.0034+- .0018	.044+- .023	.3109+- .2764
P	.0007+- .0013	.009+- .017	.0640+- .1273
S	.0158+- .0081	.202+- .104	1.4446+- 1.2701
CL	.2126+- .0255	2.721+- .326	19.4377+-14.0785
K	.0000+- .0021	.000+- .027	.0000+- .1920
CA	.0028+- .0014	.036+- .018	.2560+- .2232
TI	.0000+- .0008	.000+- .010	.0000+- .0731
V	.0008+- .0005	.010+- .006	.0731+- .0694
CR	.0009+- .0005	.012+- .006	.0823+- .0745
MN	.0003+- .0007	.004+- .009	.0274+- .0669
FE	.0130+- .0014	.166+- .018	1.1886+- .8586
NI	.0013+- .0005	.017+- .006	.1189+- .0964
CU	.0102+- .0008	.131+- .010	.9326+- .6701
ZN	.0011+- .0004	.014+- .005	.1006+- .0806
GA	.0000+- .0002	.000+- .003	.0000+- .0183
AS	.0003+- .0003	.004+- .004	.0274+- .0337
SE	.0000+- .0004	.000+- .005	.0000+- .0366
BR	.0000+- .0005	.000+- .006	.0000+- .0457
RB	.0000+- .0007	.000+- .009	.0000+- .0640
SR	.0003+- .0008	.004+- .010	.0274+- .0757
Y	.0015+- .0009	.019+- .012	.1371+- .1279
ZR	.0000+- .0026	.000+- .033	.0000+- .2377
MO	.0046+- .0037	.059+- .047	.4206+- .4524
PD	.0008+- .0026	.010+- .033	.0731+- .2434
AG	.0000+- .0030	.000+- .038	.0000+- .2743
CD	.0055+- .0036	.070+- .046	.5029+- .4872
IN	.0045+- .0047	.058+- .060	.4114+- .5206
SN	.0066+- .0057	.084+- .073	.6034+- .6763
SB	.0064+- .0083	.082+- .106	.5851+- .8663
BA	.0000+- .0197	.000+- .252	.0000+- 1.8011
LA	.0000+- .0297	.000+- .380	.0000+- 2.7154
HG	.0011+- .0010	.014+- .013	.1006+- .1163
PB	.0010+- .0021	.013+- .027	.0914+- .2028

Table 3-13. Metals Filter Analyses January 23, 1990 Site 1

295/01-003 PROTOCOL: 5 SA

SAMPLE ID: MZ178
PARTICLE SIZE: F
ANALYSIS ID: MZ178
01/29/90
EXPOSED AREA: 12.80 SQUARE CM
MASS OF DEPOSIT: 22.+- 10. MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	.0000+- .0031	.000+- .040	.0000+- .1804
SI	.0167+- .0030	.214+- .038	.9716+- .4749
P	.0000+- .0014	.000+- .018	.0000+- .0815
S	.0436+- .0099	.558+- .127	2.5367+- 1.2889
CL	.6510+- .0743	8.333+- .951	37.8764+-17.7510
K	.0244+- .0036	.312+- .046	1.4196+- .6784
CA	.0252+- .0035	.323+- .045	1.4662+- .6969
TI	.0005+- .0007	.006+- .009	.0291+- .0428
V	.0003+- .0005	.004+- .006	.0175+- .0302
CR	.0013+- .0005	.017+- .006	.0756+- .0450
MN	.0003+- .0007	.004+- .009	.0175+- .0415
FE	.0161+- .0015	.206+- .019	.9367+- .4346
NI	.0010+- .0005	.013+- .006	.0582+- .0393
CU	.0034+- .0005	.044+- .006	.1978+- .0945
ZN	.0010+- .0004	.013+- .005	.0582+- .0352
GA	.0003+- .0002	.004+- .003	.0175+- .0141
AS	.0000+- .0003	.000+- .004	.0000+- .0175
SE	.0001+- .0004	.001+- .005	.0058+- .0234
BR	.0005+- .0005	.006+- .006	.0291+- .0320
RB	.0000+- .0006	.000+- .008	.0000+- .0349
SR	.0000+- .0007	.000+- .009	.0000+- .0407
Y	.0000+- .0008	.000+- .010	.0000+- .0465
ZR	.0025+- .0023	.032+- .029	.1455+- .1493
MO	.0010+- .0034	.013+- .044	.0582+- .1996
PD	.0036+- .0024	.046+- .031	.2095+- .1690
AG	.0007+- .0028	.009+- .036	.0407+- .1640
CD	.0000+- .0035	.000+- .045	.0000+- .2036
IN	.0032+- .0043	.041+- .055	.1862+- .2641
SN	.0032+- .0052	.041+- .067	.1862+- .3142
SB	.0000+- .0081	.000+- .104	.0000+- .4713
BA	.0000+- .0180	.000+- .230	.0000+- 1.0473
LA	.0466+- .0276	.596+- .353	2.7113+- 2.0242
HG	.0000+- .0009	.000+- .012	.0000+- .0524
PB	.0000+- .0019	.000+- .024	.0000+- .1105

Table 3-14. Metals Filter Analyses January 29, 1990 Site 1

MEASUREMENT TECHNOLOGIES

8" X 10" FILTER GRAVIMETRIC REPORT

Run Day	NEA ID.	FILTER TYPE	TARE WT. GRAMS	GROSS WT. GRAMS	NET WT. MILLIGRAMS
01/05/90	MZ240	PM-10	4.6942	4.7122	18.00
01/05/90	MZ241	TSP	4.3064	4.3357	29.30
01/11/90	MZ242	PM-10	4.2967	4.3064	9.70
01/11/90	MZ243	TSP	4.3169	4.3314	14.50
01/17/90	MZ244	TSP	4.3124	4.3215	9.10
01/17/90	MZ245	PM-10	4.3170	4.3239	6.90
01/23/90	MZ246	TSP	4.3279	4.3463	18.40
01/23/90	MZ247	PM-10	4.3059	4.3184	12.50
01/29/90	MZ248	TSP	4.3355	4.3745	39.00
01/29/90	MZ249	PM-10	4.3338	4.3588	24.80

Table 3-15. Total Suspended Particulates (TSP) and Inhaleable Particulates (PM-10) Loading Monthly Summary Site 1

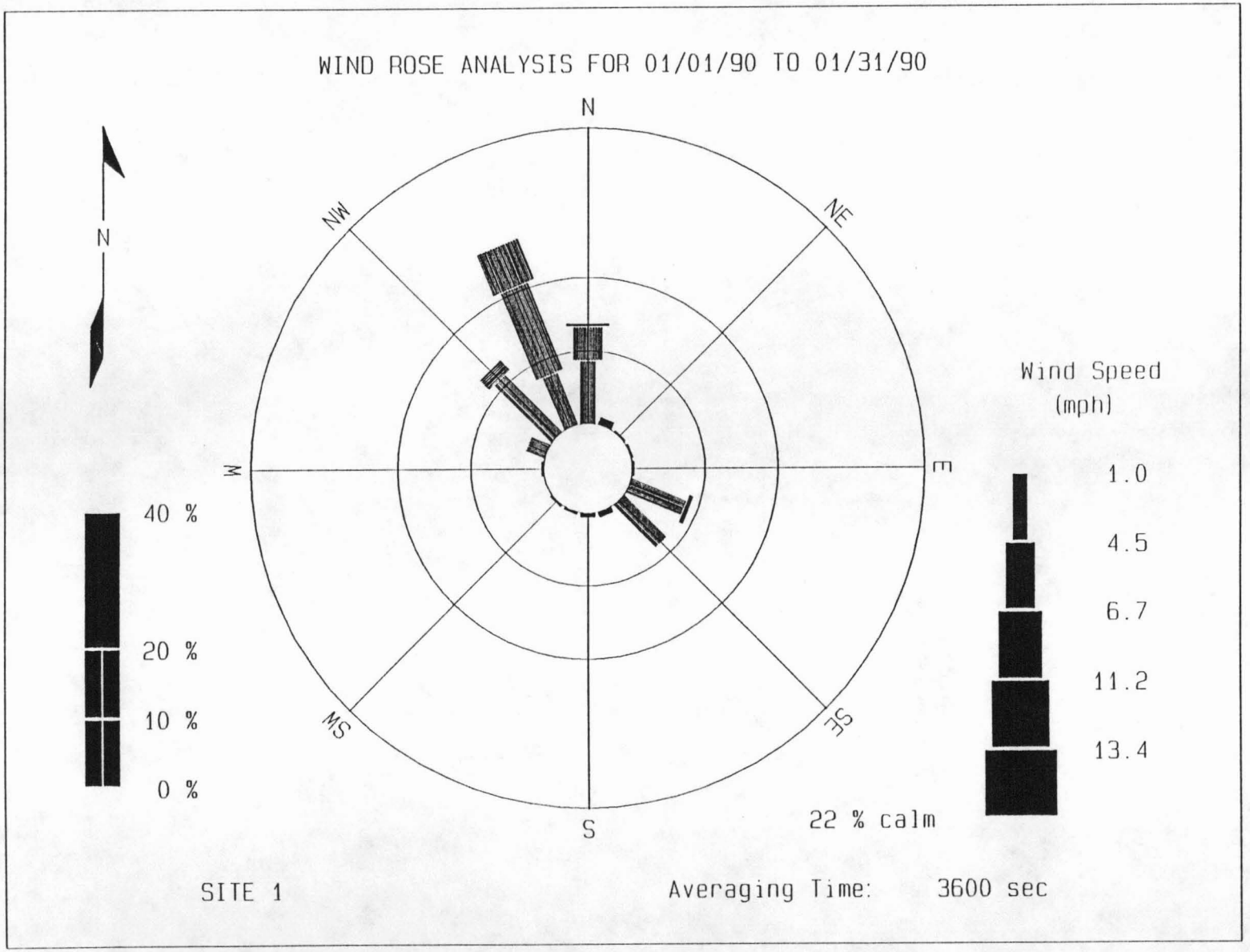

Figure 3-1. Wind Rose Analysis Site 1

WS (MPH) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	10.6	01/18/90	03:00:00
Second Highest:	10.5	01/18/90	00:00:00
Lowest Value:	0.0	01/07/90	21:00:00

Arithmetic Mean:	3.0	10.000 Percentile:	0.5
Standard Deviation:	2.2	20.000 Percentile:	0.9
		30.000 Percentile:	1.4
Geometric Mean:	2.0	40.000 Percentile:	2.0
Standard Deviation:	2.7	50.000 Percentile:	2.5
		60.000 Percentile:	3.0
Valid Data:	700	70.000 Percentile:	3.9
Invalid Data:	41	80.000 Percentile:	5.0
Missing Data:	3	90.000 Percentile:	6.1
Data Recovery:	94.09%	100.000 Percentile:	10.6

SITE 1 Averaging Time: 3600 sec

Table 3-16. Wind Speed Summary Statistics Site 1

WD (DEG) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	359.	01/08/90	11:00:00
Second Highest:	359.	01/08/90	12:00:00
Lowest Value:	0.	01/05/90	14:00:00

Arithmetic Mean:	245.	10.000 Percentile:	116.
Standard Deviation:	108.	20.000 Percentile:	125.
		30.000 Percentile:	144.
Geometric Mean:	194.	40.000 Percentile:	226.
Standard Deviation:	3.	50.000 Percentile:	308.
		60.000 Percentile:	323.
Valid Data:	700	70.000 Percentile:	333.
Invalid Data:	41	80.000 Percentile:	341.
Missing Data:	3	90.000 Percentile:	349.
Data Recovery:	94.09%	100.000 Percentile:	359.

SITE 1 Averaging Time: 3600 sec

Table 3-17. Wind Direction Summary Statistics Site 1

Sigõ1 (deg) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	121.5	01/16/90	00:00:00
Second Highest:	121.2	01/13/90	03:00:00
Lowest Value:	13.2	01/07/90	19:00:00

Arithmetic Mean:	46.0	10.000 Percentile:	19.0
Standard Deviation:	21.7	20.000 Percentile:	22.6
		30.000 Percentile:	28.7
Geometric Mean:	40.6	40.000 Percentile:	38.1
Standard Deviation:	1.7	50.000 Percentile:	45.1
		60.000 Percentile:	51.2
Valid Data:	700	70.000 Percentile:	58.3
Invalid Data:	41	80.000 Percentile:	67.0
Missing Data:	3	90.000 Percentile:	76.4
Data Recovery:	94.09%	100.000 Percentile:	121.5

SITE 1 Averaging Time: 3600 sec

Table 3-18. Sigma Theta Summary Statistics Site 1

RAIN (INCH) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	2.06	01/05/90	06:00:00
Second Highest:	1.95	01/19/90	16:00:00
Lowest Value:	0.00	01/01/90	02:00:00

Arithmetic Mean:	0.06	10.000 Percentile:	0.00
Standard Deviation:	0.19	20.000 Percentile:	0.00
		30.000 Percentile:	0.00
Geometric Mean:	0.00	40.000 Percentile:	0.00
Standard Deviation:	1.00	50.000 Percentile:	0.01
		60.000 Percentile:	0.01
Valid Data:	730	70.000 Percentile:	0.03
Invalid Data:	11	80.000 Percentile:	0.06
Missing Data:	3	90.000 Percentile:	0.12
Data Recovery:	98.12%	100.000 Percentile:	2.06

SITE 1 AIR QUALITY/MET Averaging Time: 3600 sec

Table 3-19 Precipitation Summary Statistics Site 1

TEMP (DEG F) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	77.7	01/08/90	14:00:00		
Second Highest:	77.6	01/08/90	13:00:00		
Lowest Value:	60.0	01/11/90	04:00:00		
Arithmetic Mean:	66.6			10.000 Percentile:	62.8
Standard Deviation:	3.1			20.000 Percentile:	64.0
				30.000 Percentile:	64.9
Geometric Mean:	66.5			40.000 Percentile:	65.7
Standard Deviation:	1.0			50.000 Percentile:	66.0
				60.000 Percentile:	66.9
Valid Data:	728			70.000 Percentile:	68.0
Invalid Data:	13			80.000 Percentile:	69.4
Missing Data:	3			90.000 Percentile:	70.5
Data Recovery:	97.85%			100.000 Percentile:	77.7

SITE 1 AIR QUALITY/MET Averaging Time: 3600 sec

Table 3-20. Ambient Temperature Summary Statistics Site 1

SO2 (PPB) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	6.	01/08/90	09:00:00		
Second Highest:	6.	01/20/90	16:00:00		
Lowest Value:	0.	01/01/90	00:00:00		
Arithmetic Mean:	0.			10.000 Percentile:	0.
Standard Deviation:	0.			20.000 Percentile:	0.
				30.000 Percentile:	0.
Geometric Mean:	1.			40.000 Percentile:	0.
Standard Deviation:	1.			50.000 Percentile:	0.
				60.000 Percentile:	0.
Valid Data:	631			70.000 Percentile:	0.
Invalid Data:	110			80.000 Percentile:	0.
Missing Data:	3			90.000 Percentile:	0.
Data Recovery:	84.81%			100.000 Percentile:	6.

SITE 1 AIR QUALITY/MET Averaging Time: 3600 sec

Table 3-21. Sulfur Dioxide Summary Statistics Site 1

H2S (PPB) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	0.	01/01/90	00:00:00		
Second Highest:	0.	01/01/90	01:00:00		
Lowest Value:	0.	01/01/90	00:00:00		
Arithmetic Mean:	0.		10.000 Percentile:		0.
Standard Deviation:	0.		20.000 Percentile:		0.
			30.000 Percentile:		0.
Geometric Mean:	0.		40.000 Percentile:		0.
Standard Deviation:	1.		50.000 Percentile:		0.
			60.000 Percentile:		0.
Valid Data:	709		70.000 Percentile:		0.
Invalid Data:	32		80.000 Percentile:		0.
Missing Data:	3		90.000 Percentile:		0.
Data Recovery:	95.30%		100.000 Percentile:		0.

SITE 1 AIR QUALITY/MET Averaging Time: 3600 sec

Table 3-22. Hydrogen Sulfide Summary Statistics Site 1

3.2 Meteorological Monitoring Data Site 2

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 2, MET WD (DEG) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	327	66	19	342	325	309	331	335	325	335	332	340	55	74	45	58	358	335	330	320	305	294	295	317
2	328	308	331	339	333	345	343	353	353	19	44	45	49	56	39	45	9	18	46	56	31	33	344	355
3	27	52	347	330	334	336	342	357	36	48	47	54	52	56	49	54	30	34	20	356	354	329	340	330
4	357	344	350	46	49	50	19	352	341	50	47	354	335	7	25	23	26	7	350	343	337	329	328	326
5	325	345	330	320	328	321	315	331	316	319	5	45	50	54	52	64	50	42	26	34	22	356	340	331
6	321	311	333	311	327	315	304	308	335	54	81	74	40	58	60	46	39	33	1	352	318	326	310	279
7	283	272	275	265	283	269	264	241	194	93	112	127	135	142	135	135	134	139	182	182	180	262	264	262
8	262	273	291	263	278	299	277	288	332	24	30	42	45	39	70	50	30	29	359	355	353	340	336	336
9	337	349	348	12	21	19	32	37	44	43	32	33	25	25	23	30	12	3	360	351	358	352	352	354
10	344	341	337	335	335	339	344	343	332	337	348	7	4	9	35	6	359	8	359	344	342	348	344	339
11	335	345	339	337	340	333	355	341	329	349	354	3	38	0	26	30	33	19	350	15	352	346	349	351
12	356	349	7	359	3	349	356	344	0	23	37	42	35	32	54	54	50	43	51	9	331	87	287	297
13	322	67	69	58	57	283	258	276	300	351	38	104	110	91	139	121	113	126	135	142	114	123	126	145
14	143	152	142	139	121	132	135	134	142	150	142	152	163	161	158	170	178	175	191	192	168	183	205	196
15	192	203	218	248	230	284	306	303	321	331	316	316	325	19	105	41	20	338	312	328	356	316	300	254
16	270	304	272	280	0	315	299	309	304	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
18	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
19	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
21	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
22	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
23	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
24	----	----	----	----	----	----	----	----	----	----	----	----	124	3	0	0	0	0	84	150	142	129	127	114
25	126	125	169	115	113	113	120	115	110	117	108	115	106	115	123	108	99	116	154	35	68	59	61	64
26	60	73	94	89	103	94	105	88	76	83	86	97	93	87	90	94	74	44	8	357	355	348	346	339
27	10	319	351	332	342	329	29	31	67	43	63	72	65	59	69	53	37	45	52	38	43	37	33	17
28	355	344	327	336	306	308	325	315	311	346	359	11	4	357	18	20	9	8	27	1	356	9	5	16
29	15	13	33	11	338	356	32	56	44	38	38	46	27	38	31	29	25	17	352	350	357	342	340	339
30	341	347	358	18	21	6	357	1	4	25	45	48	46	45	51	43	40	36	43	25	17	12	10	26
31	355	29	357	3	342	345	338	338	343	355	346	27	45	52	47	50	45	352	1	45	53	57	56	63

Table 3-23. Wind Direction Monthly Summary Site 2

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 2, MET WS (MPH) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	3.6	5.2	3.2	3.7	4.4	5.7	3.2	6.5	6.7	7.9	7.9	8.6	5.3	7.6	4.8	6.9	4.4	3.9	4.3	5.2	4.8	4.2	4.7	4.9
2	3.8	4.2	3.9	3.0	3.9	5.0	6.3	5.4	5.9	5.8	8.5	8.0	8.0	8.3	7.8	5.7	3.9	3.3	3.4	4.2	2.7	2.5	2.2	2.4
3	3.0	4.1	3.4	2.9	4.4	4.8	4.5	3.0	3.3	5.6	6.8	7.9	9.0	8.2	7.3	7.5	4.0	3.9	2.9	2.7	1.6	2.7	3.0	3.6
4	2.5	3.4	2.9	3.6	5.1	4.4	2.2	3.1	4.2	5.4	5.6	5.6	7.4	5.6	5.1	5.0	5.4	4.5	5.8	6.1	6.3	5.8	5.6	5.4
5	4.8	3.1	5.2	5.0	4.4	5.3	3.7	3.5	4.3	3.6	3.6	5.7	7.0	7.3	7.8	7.4	6.1	4.0	2.0	2.8	2.2	2.3	3.4	4.4
6	4.7	4.5	2.2	3.2	3.4	4.0	4.3	3.1	2.0	3.5	5.6	5.9	5.4	6.3	5.8	6.8	5.9	3.5	1.8	1.7	3.1	2.4	3.2	1.8
7	1.5	4.3	2.9	2.5	2.7	4.9	2.7	0.7	0.4	2.1	4.5	4.5	4.4	3.8	4.8	4.1	4.3	2.6	1.3	0.7	0.2	0.5	1.3	1.6
8	3.1	2.6	2.5	2.6	2.5	2.7	3.8	2.8	2.6	3.8	4.4	5.9	4.9	2.4	5.3	5.6	5.7	5.1	4.7	5.6	5.5	5.9	6.0	5.7
9	5.8	6.7	7.0	5.9	6.8	6.7	7.8	8.1	9.2	10.1	7.6	8.0	7.0	8.0	6.8	7.2	6.9	7.4	7.6	9.2	7.8	7.9	7.6	6.9
10	7.0	6.7	6.7	5.2	5.0	6.1	6.0	6.6	5.8	5.8	6.5	4.9	5.5	6.6	6.7	5.7	5.1	4.7	5.7	9.2	10.0	8.5	9.1	9.1
11	9.1	8.4	8.5	7.9	6.1	6.9	4.5	6.2	6.6	7.0	7.9	7.2	6.9	6.3	6.4	6.6	6.9	5.3	7.0	5.4	6.9	8.4	6.8	7.3
12	6.6	7.2	5.3	4.9	5.1	5.8	5.9	5.7	4.8	4.5	5.5	5.4	5.4	4.5	6.3	5.2	3.5	2.2	2.3	0.9	1.5	5.4	2.7	2.6
13	0.5	1.5	1.5	1.0	1.8	0.9	1.8	2.0	2.8	0.1	0.6	3.3	3.8	1.5	2.3	2.7	3.2	2.0	0.3	0.0	0.4	2.3	0.9	0.6
14	1.4	1.4	2.3	2.7	3.1	2.5	3.6	4.5	4.5	5.0	4.9	4.3	2.3	4.6	3.9	2.1	2.4	3.0	1.0	0.2	0.8	3.0	3.5	3.0
15	3.3	0.8	0.3	1.0	1.5	1.2	3.3	3.3	6.3	5.2	4.5	3.9	2.2	1.6	2.0	0.5	0.1	1.3	0.9	1.4	1.7	4.7	1.2	0.3
16	0.0	1.4	3.1	0.3	0.0	2.8	2.9	2.0	0.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
18	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
19	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
21	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
22	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
23	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
24	----	----	----	----	----	----	----	----	----	----	----	----	4.7	4.6	4.4	4.0	1.8	1.7	0.6	1.4	1.4	2.1	2.6	2.2
25	1.9	0.9	0.4	1.4	3.6	4.1	1.6	1.9	1.7	2.4	1.6	0.9	3.9	2.4	0.5	0.4	1.4	0.4	0.2	0.1	0.2	0.2	0.5	0.3
26	0.4	0.7	0.9	1.1	1.3	1.4	1.7	0.4	1.0	1.1	0.6	2.3	0.8	1.1	1.4	1.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
27	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	1.1	0.3	1.1	0.8	2.1	1.7	2.5	2.7	1.8	1.4	3.7	0.6	0.6	0.1	0.1	0.1
28	0.1	0.2	0.1	0.1	0.6	0.2	0.2	0.4	0.5	0.4	1.2	1.7	1.1	0.7	1.6	0.9	1.5	2.8	4.9	6.4	5.8	5.0	4.2	4.3
29	3.9	3.4	3.0	4.0	2.7	0.7	0.6	0.6	0.7	1.2	1.0	2.3	2.8	4.5	6.6	6.7	6.3	4.8	5.7	5.8	6.0	8.0	7.9	7.5
30	6.9	5.6	5.3	5.1	4.6	3.6	5.4	4.3	5.7	5.8	8.0	9.6	7.7	6.5	7.0	7.2	7.8	7.1	7.2	4.5	5.0	5.1	4.1	7.2
31	6.9	5.9	3.4	2.9	5.1	5.6	6.0	5.3	2.4	3.7	2.0	2.1	5.0	6.6	4.2	7.7	6.0	3.3	2.2	4.2	4.8	2.7	4.7	4.8

Table 3-24. Wind Speed Monthly Summary Site 2

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 2, MET Sigθ1 (deg) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	32.5	23.2	35.8	35.7	25.3	12.8	29.1	23.2	19.2	19.0	18.7	30.0	34.2	20.5	26.3	23.2	27.1	27.8	19.2	17.0	20.7	22.9	17.7	14.8
2	26.9	18.0	18.7	34.4	18.5	31.2	27.1	35.6	31.8	32.6	22.9	24.7	24.5	23.0	25.2	28.9	36.6	39.6	35.9	20.9	32.9	28.1	27.1	28.2
3	32.2	24.6	31.8	36.3	24.0	21.6	29.6	41.1	29.0	23.5	21.6	20.1	21.0	23.1	23.8	22.6	30.0	30.1	26.2	31.2	39.7	20.4	33.6	24.9
4	35.6	32.9	36.4	33.4	18.7	19.9	26.7	35.1	30.3	30.3	26.3	35.0	25.1	35.2	32.6	33.9	34.1	38.4	32.6	25.8	22.6	17.6	18.2	16.5
5	22.7	36.4	20.3	22.6	25.2	16.5	25.8	21.2	27.3	28.2	34.6	27.0	26.4	23.0	21.8	21.9	20.3	18.7	27.6	28.5	27.5	33.6	25.3	18.5
6	15.8	16.1	38.3	22.7	23.5	15.4	15.8	16.0	24.5	22.7	19.0	26.0	32.6	22.4	24.8	24.0	22.3	27.8	27.3	26.2	18.8	15.7	16.3	28.2
7	26.9	14.3	18.8	56.4	21.0	21.5	25.8	24.8	33.0	27.6	29.6	34.1	37.1	43.0	34.2	35.1	28.5	25.3	12.8	16.4	75.0	75.6	14.1	18.3
8	13.6	18.2	23.0	40.5	15.8	18.0	14.1	14.3	24.3	27.0	29.1	24.9	28.2	44.9	25.9	25.9	31.4	25.7	26.4	23.5	24.3	19.7	16.1	14.7
9	17.5	21.8	23.5	32.2	33.4	34.8	27.3	25.2	23.4	25.4	29.5	29.6	33.4	30.2	32.2	30.1	34.7	35.7	35.1	34.0	35.5	34.4	34.6	35.2
10	28.5	24.3	23.1	23.0	24.5	25.9	28.6	27.8	22.0	22.6	32.0	37.3	39.4	36.7	30.6	35.5	34.5	38.5	34.7	25.3	23.8	30.9	24.8	22.6
11	19.7	29.8	22.1	21.2	28.2	19.0	32.5	26.9	21.4	30.2	33.7	36.3	29.7	39.6	32.3	30.4	28.9	36.9	28.4	34.6	31.4	26.0	30.9	32.8
12	33.9	30.7	37.9	35.3	35.2	30.0	26.8	25.2	33.9	32.3	29.6	28.1	29.7	33.1	22.1	21.6	21.3	27.6	23.8	29.2	32.9	29.5	28.0	38.0
13	56.2	31.5	39.7	46.5	49.0	23.2	48.9	55.4	16.4	54.4	47.2	26.7	31.1	74.5	34.7	29.2	23.5	27.9	22.6	29.5	45.5	48.4	26.8	36.7
14	28.9	36.3	34.5	34.2	26.8	40.6	30.0	30.2	35.1	37.8	38.5	43.7	47.3	38.9	43.7	39.7	30.1	35.3	35.2	77.0	39.6	37.1	29.7	31.3
15	35.1	41.0	77.6	82.8	14.9	67.9	54.9	24.5	15.5	27.9	20.2	22.9	19.1	30.9	29.8	38.9	36.1	25.8	33.6	27.0	28.0	24.3	30.7	77.9
16	60.3	25.2	17.4	77.9	47.3	12.1	14.8	21.2	24.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
18	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
19	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
21	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
22	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
23	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
24	----	----	----	----	----	----	----	----	----	----	----	----	35.0	26.0	0.0	0.0	0.0	0.0	34.1	30.6	31.9	28.5	25.7	24.7
25	27.9	27.9	26.9	45.7	26.4	27.3	25.3	25.1	24.3	25.1	27.4	28.7	25.7	28.5	29.1	22.6	21.4	21.9	31.7	56.6	24.7	20.7	26.9	22.6
26	31.4	23.2	48.9	24.3	27.0	24.1	21.5	28.7	34.0	21.4	22.4	22.5	25.8	22.7	20.1	21.0	19.6	22.3	27.9	26.4	32.4	28.2	23.2	31.9
27	32.5	19.2	44.5	28.7	31.5	27.8	32.2	35.5	31.9	29.7	26.4	25.7	21.2	23.8	19.9	24.9	27.4	34.5	21.4	29.2	26.4	27.0	23.7	34.2
28	30.8	25.7	16.3	25.2	14.7	15.7	26.9	18.7	16.3	32.5	34.0	35.2	35.3	36.3	32.3	35.0	36.8	35.1	33.3	34.0	32.3	33.4	34.5	30.3
29	34.4	38.9	28.1	32.6	31.3	35.8	34.7	24.6	21.4	23.1	27.0	27.3	33.3	28.6	28.1	30.1	32.8	35.5	31.2	26.9	30.8	24.2	21.5	20.9
30	21.8	29.2	34.4	33.5	33.3	35.8	31.8	35.3	30.6	30.7	22.9	20.4	22.5	25.6	20.7	22.5	22.6	25.6	21.3	30.9	33.9	33.7	36.2	30.1
31	31.9	31.3	35.1	31.5	22.1	27.8	21.2	21.3	31.8	27.3	28.0	30.1	22.4	20.1	20.8	21.3	22.1	31.5	48.1	27.5	28.0	26.8	22.6	23.4

Table 3-25. Sigma Theta Monthly Summary Site 2

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 2, MET VWS (MPH) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-0.1	-0.3	-0.1	-0.1	0.0	0.1	0.0	-0.2	-0.1	-0.2	-0.1	-0.3	-0.2	-0.5	-0.2	-0.4	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.0
2	-0.1	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.2	-0.1	0.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0
3	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.3	-0.3	-0.2	-0.3	-0.2	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0
4	-0.1	0.0	-0.1	-0.2	-0.1	-0.1	0.0	0.0	0.0	-0.3	-0.2	0.1	0.0	-0.1	-0.1	-0.2	-0.1	0.0	0.1	-0.1	-0.1	-0.1	0.0	-0.1
5	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.3	-0.1	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.2	-0.4	-0.3	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1
7	0.0	0.0	-0.1	0.0	0.0	0.2	0.0	0.0	0.1	-0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1
8	0.1	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	-0.3	-0.1	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.1
9	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.1	-0.2	-0.2	-0.1	0.0	-0.1	0.1	-0.2	0.0	-0.2	0.0	-0.1	-0.2	-0.2	0.0	0.0	-0.1
10	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.3	-0.1	0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1
11	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	0.1	0.0	-0.1	0.0	-0.1	0.0	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	0.0	-0.1	0.0	0.0	-0.2	-0.2	-0.1
13	-0.1	-0.1	-0.1	0.0	0.0	-0.2	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
14	0.1	0.1	0.2	0.3	0.1	0.2	0.3	0.4	0.5	0.5	0.4	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.4	0.4	0.4
15	0.4	0.1	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	-0.1	0.0
16	0.0	-0.2	-0.2	0.0	0.0	0.1	0.0	-0.1	0.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
18	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
19	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
21	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
22	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
23	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
24	----	----	----	----	----	----	----	----	----	----	----	----	0.3	0.4	0.6	0.5	0.5	0.4	0.5	0.5	0.4	0.3	0.4	0.2
25	0.4	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.0	0.2	0.3	0.1	0.0	0.2	0.1	0.1	0.0	0.1	0.0	0.0
26	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1
27	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.1
28	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1
29	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.1	0.1	0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.3	-0.1	-0.1	-0.1	-0.2	0.0	-0.3	0.0	0.1	0.1	0.0	-0.2
31	0.0	-0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	-0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	-0.4

Table 3-26. Vertical Wind Speed Monthly Summary Site 2

MONTHLY SUMMARY REPORT

TRUE GEOTHERMAL

LOCATION: SITE 2, MET SIG W (DEG) DATA FOR: JAN 1990

HOURS (HST)

HR-END DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.3
2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.7	0.8	0.8	0.9	0.7	0.8	0.6	0.5	0.4	0.5	0.4	0.4	0.3	0.2	0.3
3	0.3	0.4	0.3	0.2	0.3	0.3	0.5	0.4	0.4	0.5	0.6	0.7	0.8	0.7	0.7	0.7	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2
4	0.3	0.3	0.2	0.4	0.4	0.4	0.2	0.3	0.3	0.6	0.6	0.6	0.5	0.6	0.7	0.6	0.7	0.6	0.4	0.4	0.4	0.3	0.4	0.3
5	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.4	0.4	0.5	0.6	0.7	0.6	0.7	0.6	0.5	0.3	0.2	0.3	0.2	0.2	0.2	0.2
6	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.5	0.5	0.7	0.6	0.4	0.2	0.2	0.2	0.1	0.3	0.1
7	0.2	0.3	0.2	0.1	0.2	0.4	0.3	0.1	0.1	0.3	0.6	0.7	0.8	0.7	0.8	0.7	0.6	0.4	0.1	0.1	0.0	0.1	0.1	0.1
8	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.7	0.6	0.5	0.5	0.5	0.4	0.3	0.3
9	0.3	0.5	0.5	0.8	0.9	0.9	0.9	0.9	0.9	1.0	0.9	1.0	0.9	1.1	1.0	1.0	0.8	0.9	0.8	0.8	0.7	0.7	0.7	0.7
10	0.5	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.4	0.6	0.8	0.8	0.9	0.8	0.8	0.8	0.7	0.6	0.7	0.7	0.8	0.5	0.6
11	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.8	0.8	0.8	0.9	0.9	1.0	0.8	0.6	0.7	0.6	0.6	0.6	0.6
12	0.7	0.6	0.6	0.5	0.6	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.5	0.2	0.3
13	0.1	0.2	0.3	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.6	0.7	0.4	0.6	0.5	0.6	0.5	0.3	0.2	0.3	0.5	0.4	0.3
14	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.8	1.1	1.1	1.1	1.1	0.8	1.1	1.0	0.8	0.6	0.7	0.6	0.4	0.5	0.8	0.8	0.8
15	0.8	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.1
16	0.1	0.1	0.2	0.1	0.0	0.2	0.2	0.2	0.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
18	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
19	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
21	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
22	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
23	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
24	----	----	----	----	----	----	----	----	----	----	----	----	1.0	1.0	1.1	1.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6
25	0.6	0.5	0.3	0.5	0.7	0.8	0.6	0.6	0.6	0.7	0.7	0.6	0.8	0.7	0.7	0.4	0.5	0.3	0.2	0.1	0.2	0.2	0.4	0.4
26	0.3	0.5	0.4	0.5	0.4	0.5	0.5	0.3	0.4	0.4	0.5	0.6	0.4	0.5	0.6	0.6	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.3
27	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.4	0.5	0.5	0.6	0.7	0.7	0.6	0.7	0.5	0.5	0.4	0.5	0.4
28	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.7	0.7	0.7	0.6	0.8	0.8	0.9	0.8	0.7	0.8	0.7	0.8	0.7	0.6
29	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.9	0.8	1.0	0.9	1.0	0.7	0.5	0.5	0.6	0.6	0.6	0.6
30	0.5	0.5	0.7	0.7	0.6	0.7	0.7	0.5	0.8	0.7	0.8	0.8	0.7	0.8	0.8	0.9	0.7	0.8	0.7	0.7	0.8	0.7	0.6	0.8
31	0.7	0.6	0.5	0.5	0.4	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.7	0.6	0.7	0.7	0.6	0.4	0.4	0.5	0.6	0.3	0.5	0.4

Table 3-27. Sigma W Monthly Summary Site 2

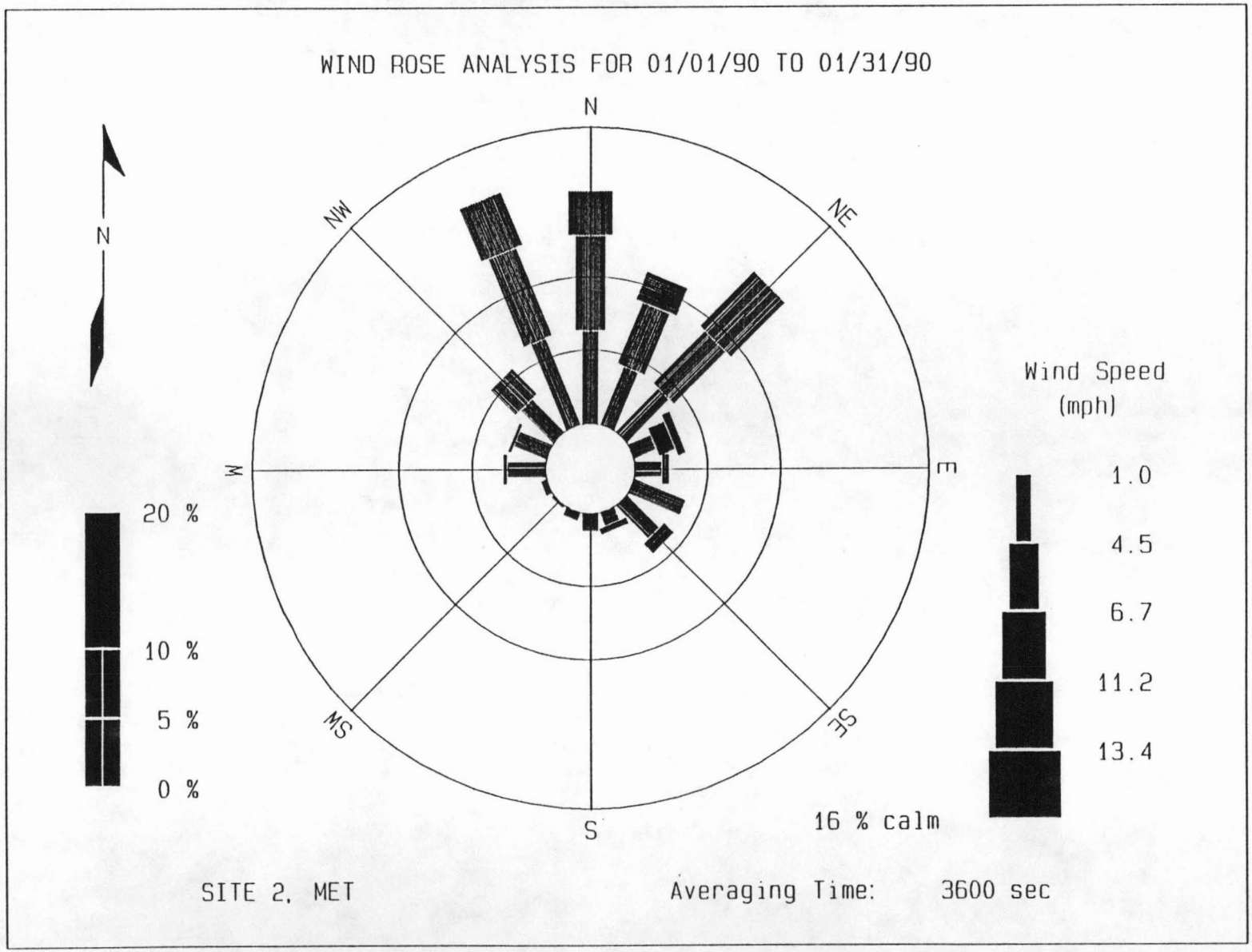

Figure 3-2. Wind Rose Analysis Site 2

WD (DEG) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	360.	01/09/90	18:00:00
Second Highest:	359.	01/08/90	18:00:00
Lowest Value:	0.	01/11/90	13:00:00

Arithmetic Mean:	176.	10.000 Percentile:	19.
Standard Deviation:	137.	20.000 Percentile:	36.
		30.000 Percentile:	50.
Geometric Mean:	99.	40.000 Percentile:	76.
Standard Deviation:	4.	50.000 Percentile:	135.
		60.000 Percentile:	270.
Valid Data:	549	70.000 Percentile:	321.
Invalid Data:	0	80.000 Percentile:	337.
Missing Data:	195	90.000 Percentile:	349.
Data Recovery:	73.79%	100.000 Percentile:	360.

SITE 2, MET Averaging Time: 3600 sec

Table 3-28. Wind Direction Summary Statistics Site 2

WS (MPH) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	10.1	01/09/90	09:00:00
Second Highest:	10.0	01/10/90	20:00:00
Lowest Value:	0.0	01/13/90	19:00:00

Arithmetic Mean:	3.8	10.000 Percentile:	0.5
Standard Deviation:	2.4	20.000 Percentile:	1.4
		30.000 Percentile:	2.3
Geometric Mean:	2.6	40.000 Percentile:	3.0
Standard Deviation:	3.1	50.000 Percentile:	3.9
		60.000 Percentile:	4.6
Valid Data:	549	70.000 Percentile:	5.4
Invalid Data:	0	80.000 Percentile:	6.0
Missing Data:	195	90.000 Percentile:	7.2
Data Recovery:	73.79%	100.000 Percentile:	10.1

SITE 2, MET Averaging Time: 3600 sec

Table 3-29. Wind Speed Summary Statistics Site 2

Sigõ1 (deg) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	82.8	01/15/90	03:00:00
Second Highest:	77.9	01/15/90	23:00:00
Lowest Value:	0.0	01/24/90	14:00:00

Arithmetic Mean:	28.9	10.000 Percentile:	19.0
Standard Deviation:	10.0	20.000 Percentile:	22.1
		30.000 Percentile:	24.0
Geometric Mean:	27.2	40.000 Percentile:	25.9
Standard Deviation:	1.5	50.000 Percentile:	27.9
		60.000 Percentile:	30.0
Valid Data:	549	70.000 Percentile:	32.2
Invalid Data:	0	80.000 Percentile:	34.5
Missing Data:	195	90.000 Percentile:	37.1
Data Recovery:	73.79%	100.000 Percentile:	82.8

SITE 2, MET Averaging Time: 3600 sec

Table 3-30. Sigma Theta Summary Statistics Site 2

VWS (MPH) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	0.6	01/24/90	14:00:00
Second Highest:	0.5	01/14/90	13:00:00
Lowest Value:	-0.5	01/01/90	13:00:00

Arithmetic Mean:	0.0	10.000 Percentile:	-0.2
Standard Deviation:	0.2	20.000 Percentile:	-0.1
		30.000 Percentile:	-0.1
Geometric Mean:	0.0	40.000 Percentile:	0.0
Standard Deviation:	1.0	50.000 Percentile:	0.0
		60.000 Percentile:	0.0
Valid Data:	549	70.000 Percentile:	0.0
Invalid Data:	0	80.000 Percentile:	0.1
Missing Data:	195	90.000 Percentile:	0.2
Data Recovery:	73.79%	100.000 Percentile:	0.6

SITE 2, MET Averaging Time: 3600 sec

Table 3-31. Vertical Wind Speed Summary Statistics Site 2

SIG W (DEG) SUMMARY STATISTICS FOR 01/01/90 - 01/31/90

Highest Value:	1.146	01/09/90	13:00:00
Second Highest:	1.146	01/14/90	08:00:00
Lowest Value:	0.020	01/16/90	04:00:00

Arithmetic Mean:	0.489	10.000 Percentile:	0.198
Standard Deviation:	0.231	20.000 Percentile:	0.257
		30.000 Percentile:	0.336
Geometric Mean:	0.000	40.000 Percentile:	0.415
Standard Deviation:	1.000	50.000 Percentile:	0.474
		60.000 Percentile:	0.553
Valid Data:	549	70.000 Percentile:	0.612
Invalid Data:	0	80.000 Percentile:	0.672
Missing Data:	195	90.000 Percentile:	0.790
Data Recovery:	73.79%	100.000 Percentile:	1.146

SITE 2, MET Averaging Time: 3600 sec

Table 3-32. Sigma W Summary Statistics Site 2

MEASUREMENT TECHNOLOGIES

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